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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,002	09/17/2003	Hongqin Shi	P120-US	6613
26148	7590	09/08/2005	EXAMINER	
REFLECTIVITY, INC. 350 POTRERO AVENUE SUNNYVALE, CA 94085			THOMAS, BRANDI N	
			ART UNIT	PAPER NUMBER
			2873	
DATE MAILED: 09/08/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/666,002	Applicant(s) SHI ET AL.	
	Examiner Brandi N. Thomas	Art Unit 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 73-88 is/are pending in the application.
- 4a) Of the above claim(s) 1-72 and 89-97 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 73-83 and 86-88 is/are rejected.
- 7) ☒ Claim(s) 84 and 85 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


RICKY MACK
PRIMARY EXAMINER

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/04, 4/04, 10/04; 5.</u> | 6) <input checked="" type="checkbox"/> Other: <u>Detailed Action.</u> |

DETAILED ACTION

Information Disclosure Statement

1. Acknowledgement is made of receipt of Information Disclosure Statement(s) (PTO-1449) filed 9/17/03, 4/26/04, 10/26/04, and 5/16/05. An initialed copy is attached to this Office Action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 73-83 and 86-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aubuchon (US 2004/0165250 A1) in view of Chinn et al. (2003/0080082 A1).

Regarding claim 73, Aubuchon discloses, in figures 3A-3C, 4A-4E, and 5A, a method for fabricating a micromirror (46), the method comprising: preparing a substrate (60) (section 0047); depositing one or more sacrificial layers; forming a mirror plate (124) and a hinge layer (56) on the one or more sacrificial layers (110) (section 0055) but does not specifically disclose preparing a vapor phase etchant recipe such that a mean-free-path of the etchant recipe is equal to or less than a minimum thickness of the one or more sacrificial layers; and removing the sacrificial layers using the prepared etchant recipe. Chinn et al. discloses preparing a vapor phase etchant recipe such that a mean-free-path of the etchant recipe is equal to or less than a minimum thickness of the one or more sacrificial layers; and removing the sacrificial layers

using the prepared etchant recipe (sections 0031 and 0032). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Aubuchon with the vapor phase etchant of Chinn et al. for the purpose of removing the sacrificial layers and to prevent capillary action force (section 0030).

Regarding claims 74, 75, 87, and 88, Aubuchon discloses, in figures 3A-3C, 4A-4E, and 5A, a method for fabricating a micromirror (46), wherein the minimum thickness of the sacrificial layer is around 1.5 micrometers or larger and 0.5 micrometers or larger (section 0049) but does not specifically disclose wherein the mean-free-path is equal to or less than 1.5 micrometers and equal to or less than 0.5 micrometers (section 0035). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Aubuchon with the mean-free-path of Chinn et al. for the purpose of removing the sacrificial layers and to prevent capillary action force (section 0030).

Regarding claim 76, Chinn et al. discloses a method for fabricating a micromirror (46), wherein the sacrificial material is amorphous silicon (section 0030).

Regarding claim 77, Chinn et al. discloses a method for fabricating a micromirror (46), wherein the step of preparing the etchant recipe further comprises: preparing the etchant recipe by mixing a spontaneous vapor phase chemical etchant with a diluent gas, wherein the chemical etchant is from a group comprising an interhalogen gas, a noble gas halide and HF (sections 0030-0032).

Regarding claim 78, Chinn et al. discloses a method for fabricating a micromirror (46), wherein the interhalogen comprises bromine trifluoride; and wherein the noble gas halide comprises XeF₂ (section 0035).

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Regarding claim 79, Chinn et al. discloses a method for fabricating a micromirror (46), wherein the diluent gas is selected from a group comprising He, N₂, Ar, Kr, Ne, and Xe (section 0035).

Regarding claim 80, Chinn et al. discloses a method for fabricating a micromirror (46), wherein the etchant recipe has a total pressure of from 1 to 700 torr (section 0035).

Regarding claim 81, Chinn et al. discloses a method for fabricating a micromirror (46), wherein the etchant recipe has a total pressure higher than 2 atmospheres (section 0035).

Regarding claim 82, Chinn et al. discloses a method for fabricating a micromirror (46), wherein the etchant recipe has a total pressure of from 1 to 15 torr (section 0035).

Regarding claim 83, Chinn et al. discloses a method for fabricating a micromirror (46), wherein the diluent gas has a total pressure of from 1 to 700 torr (section 0035).

Regarding claim 86, Aubuchon discloses, in figures 3A-3C and 5A, a method for fabricating a micromirror (46), wherein the step of depositing one or more sacrificial layers (110) further comprises: depositing a first sacrificial (90) layer between the substrate (60) and the mirror plate (124) and a second sacrificial layer (110) between the mirror plate (124) and the hinge layer (56) (sections 0049 and 0053).

Allowable Subject Matter

4. Claims 84 and 85 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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5. The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the independent claim(s), in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in claim(s) 84 and 85, wherein the claimed invention comprises wherein a ration of a partial pressure of the chemical etchant gas to a partial pressure of the diluent gas is from 1/1000 to 1/10, as claimed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandi N. Thomas whose telephone number is 571-272-2341. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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RICKY MACK
PRIMARY EXAMINER